SABRINA SEA FLOOR SURVEY

(IN2017-V01)

PISTON CORE IMAGES, VISUAL LOGS AND GRAIN SIZE DATA SUMMARIES

IN2017-V01-C012-PC05

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Introduction

This document presents images, colour description, colour analysis profiles and summary grain size data for individual core sections from piston core IN2017-V01-C012-PC05 collected during the Sabrina Sea Floor Survey on the *RV Investigator* between January and March 2017. Detail of the survey can be obtained in the post-survey report (Armand et al., 2018).

Core Details

The core was collected with the RV Investigator piston corer.

Core Number: IN2017-V01-C012-PC05

Locations: Longitude 119.3012 Latitude -64.675 (WGS84)

Water depth: 3115 m

Length: 1609 m

Section Labelling

IN2017-V01 piston cores are labelled by number and letter with the bottom section labelled number 01 as it comes from the core barrel. Letter A is given to the top section with letters in descending alphabetic order. Depths are given in centimeters (Table 1).

Core section	Top Depth (cm)	Bottom Depth (cm)
18A	0	59
17B	59	122
16C	122	189
15D	189	270
14E	270	370
13F	370	469
12G	469	570
11H	570	668
10I	668	768
09J	768	869
08K	869	967
07L	967	1032
06M	1032	1112
05N	1112	1212
04O	1212	1310
03P	1310	1413
02Q	1413	1515
01R	1515	1609

Core processing

Cores were split and described at the Geoscience Australia core repository. Initial descriptions included structure, texture and Munsell colour of the cut and scraped surface. Photos were taken using a hand held digital camera at the time of description but high resolution optical scans were obtained using the camera of the Avaatech XRF Scanner at the Research School of Earth Sciences, ANU.

Image Processing and analysis

Image adjustments, enhancement and analysis were conducted using the ImageJ-Fiji software package version 1.52n which is a public domain image processing package (Schindelin et al., 2012). Image files, both tiff and jpeg, from the Avaatech scanner were adjusted using the IMAGE>ADJUST>BRIGHTNESS & CONTRAST facility to achieve images close to the Munsell Colours logged when the cores were split. The best results were obtained by reducing the Maximum brightness from 255 to 70. This was applied to all cores and resulting files saved separately, retaining the original scan files.

Sediment "brightness" was measured using the ANALYZE>PLOT PROFILE facility. A rectangle was drawn for the length of each core that minimised the number of cracks, holes and other artefacts influencing the result. Then a plot of Pixel Intensity against core depth was produced for each core.

Miguez-Sala et al. (2019) describe several contrast-enhancing methods that can be used in the study of trace fossils in cores. We chose to use the Contrast Limited Adaptive Histogram Equalisation (CLAHE) on each core image. CLAHE produces local histograms for redistributing lightness values for different parts of the image. The Contrast Limiting reduces the amplification of noise for uniform parts of the image. CLAHE was chosen because it could be used uniformly and easily for all images. Further step used by Miguez-Sala et al. (2019) were not applied. The effects of CLAHE were to enhance some colour changes and boundaries within cores while changing the colours from the original. CLAHE was applied using ImageJ-Fiji PROCESS>ENHANCE CONTRAST with Equalising Histograms turned on and Saturated Pixels set at 0.3%.

Adjusted images, CLAHE images and Pixel Intensity graphs are plotted against depth for all cores.

Grain Size

Grain size information was obtained using a Malvern Laser Grain Size analyser in the laboratories of Geoscience Australia. Samples were taken at 10 cm intervals. Data are presented as bar graphs showing Clay-Silt-Sand for each sample.

Presentation

All data and images were loaded into Strater 3 software and plotted against depth for each core section.

References

Miguez-Sala, O., Dorador, J. and Rodríguez-Tovar, J., 2019. Introducing Fiji and ICY image processing techniques in ichnological research as tool for sedimentary analysis. Marine Geology, 413, 1-9.

Schindelin, J., Arganda-Carreras, I., Frise, E., Kaynig, V., Longair, M., Pietzsch, T., Preibisch, S., Rueden, C., Saalfeld, S., Schmid, B., Tinevez, J-Y., White, D.J., Hartenstein, V., Eliceiri, K., Tomancak., P. and Cardona, A., 2012. Fiji: an open-source platform for biological-image analysis. Nature Methods, 9 (7), 676-682.

Acknowledgments

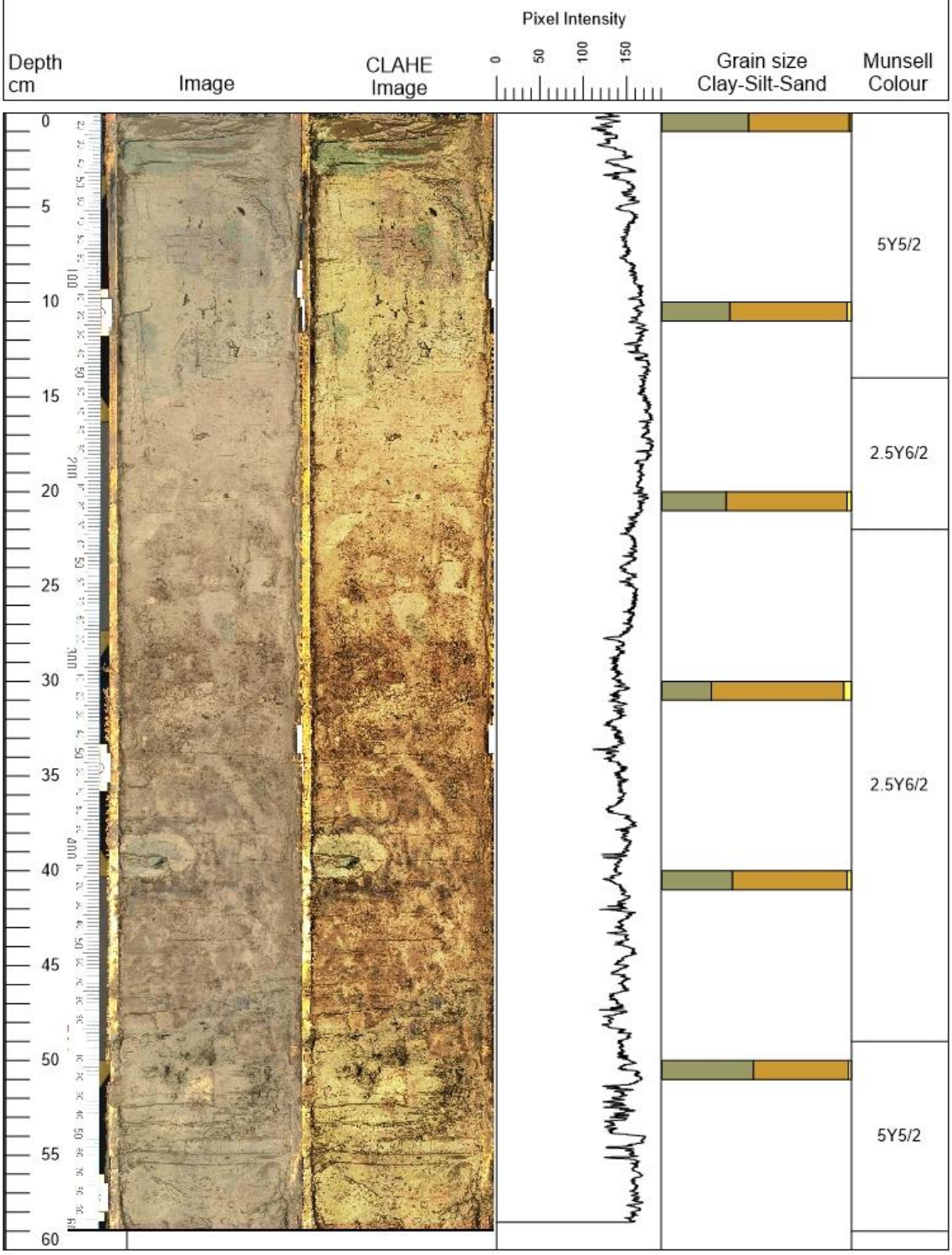
The authors wish to thank the CSIRO Marine National Facility (MNF) for its support in the form of sea time on RV Investigator, support personnel, scientific equipment and data management. All data and samples acquired on the voyage are made publicly available in accordance with MNF Policy.

This Project is supported through funding from the Australian Government's Australian Antarctic Science Grant Program (AAS #4333).

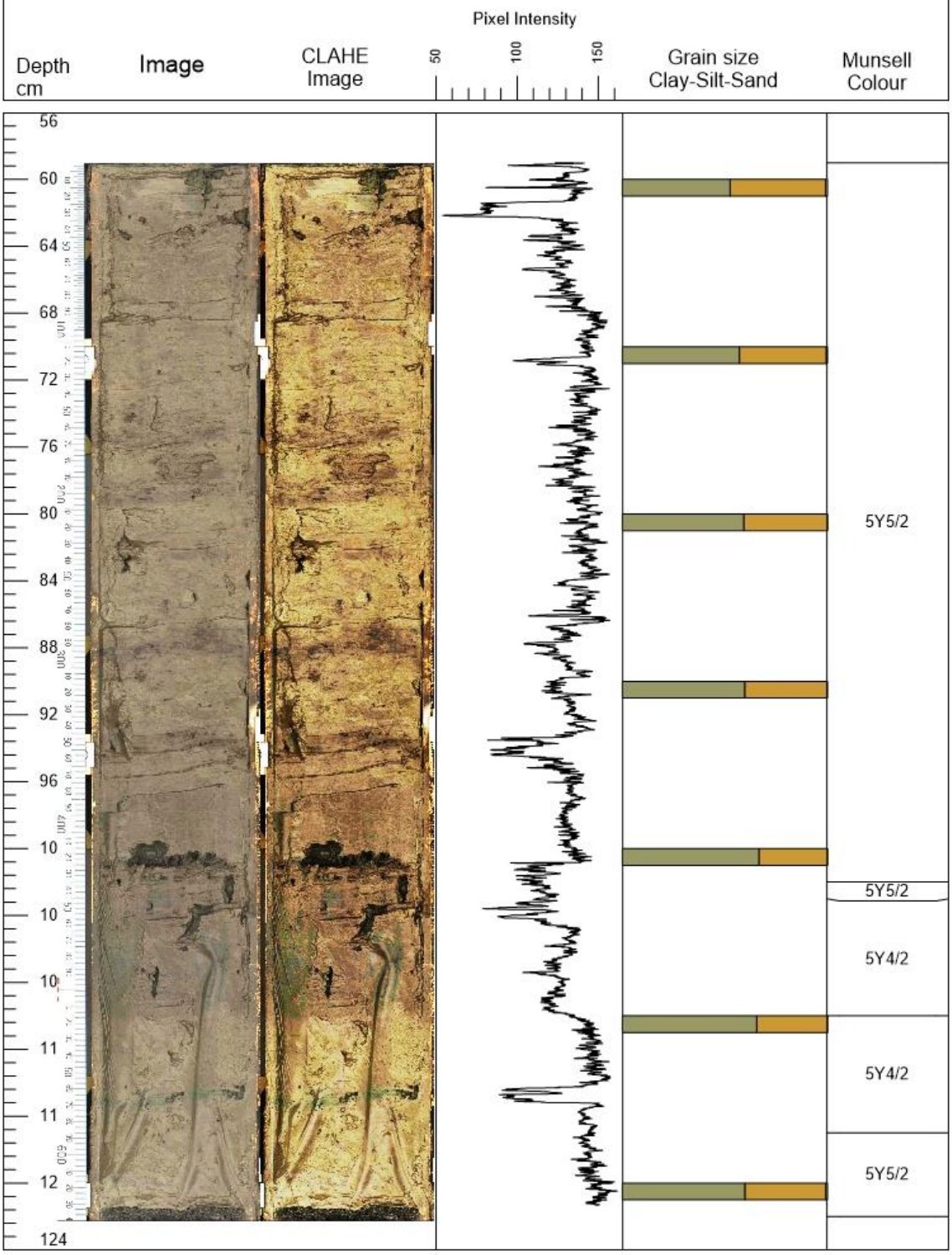
We thank the Marine National Facility, the IN2017-V01 scientific party-led by the Chief Scientists L.K. Armand and P. O'Brien, MNF support staff and ASP crew members led by Capt. M. Watson for their help and support on board the RV Investigator.

Grain size analyses were carried out by Aziah Williamson at Geoscience Australia. Alix Post publishes with permission of the CEO, Geoscience Australia under creative commons.

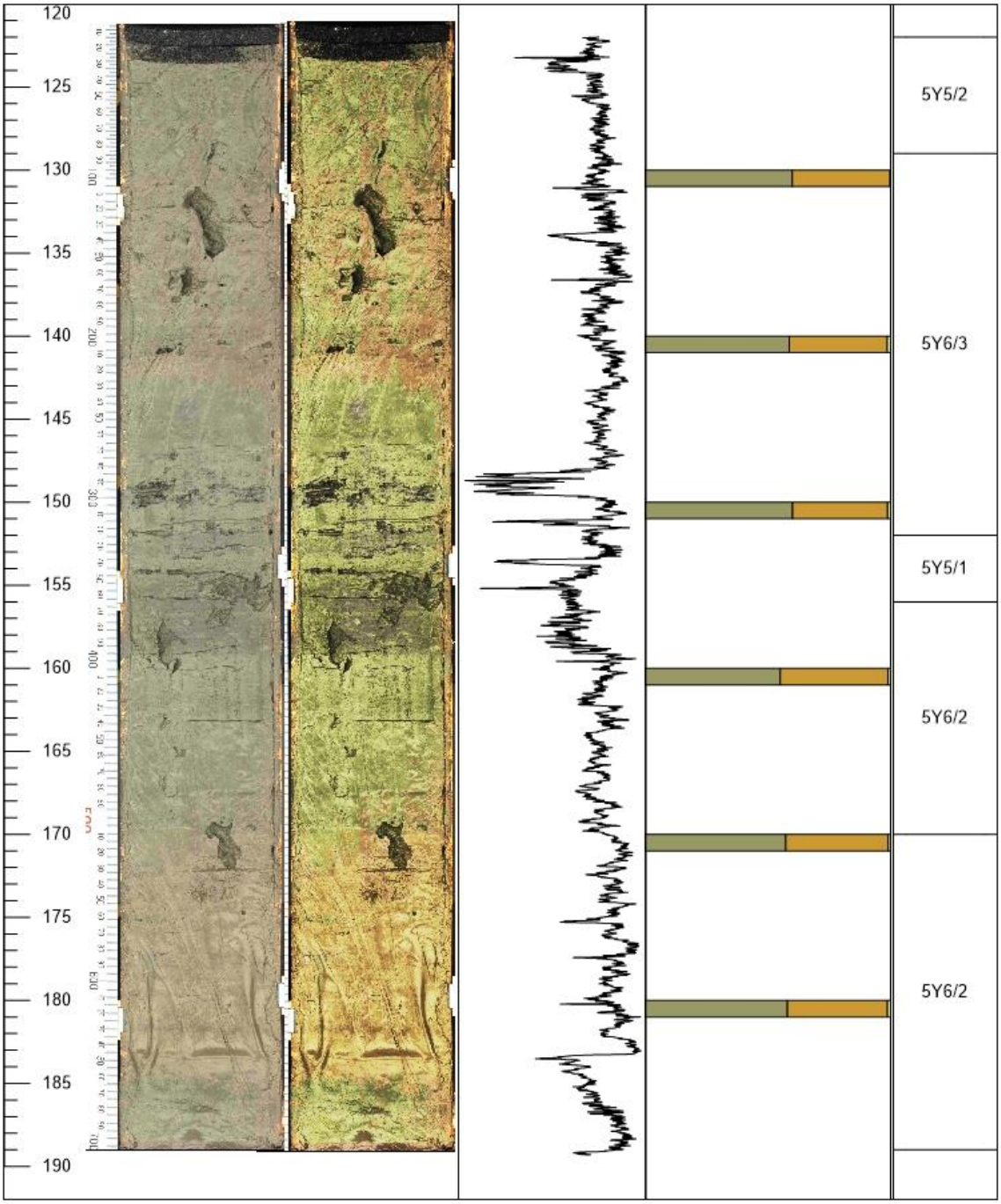
IN2017-V01-C012-PC05-18A
0-59 cm



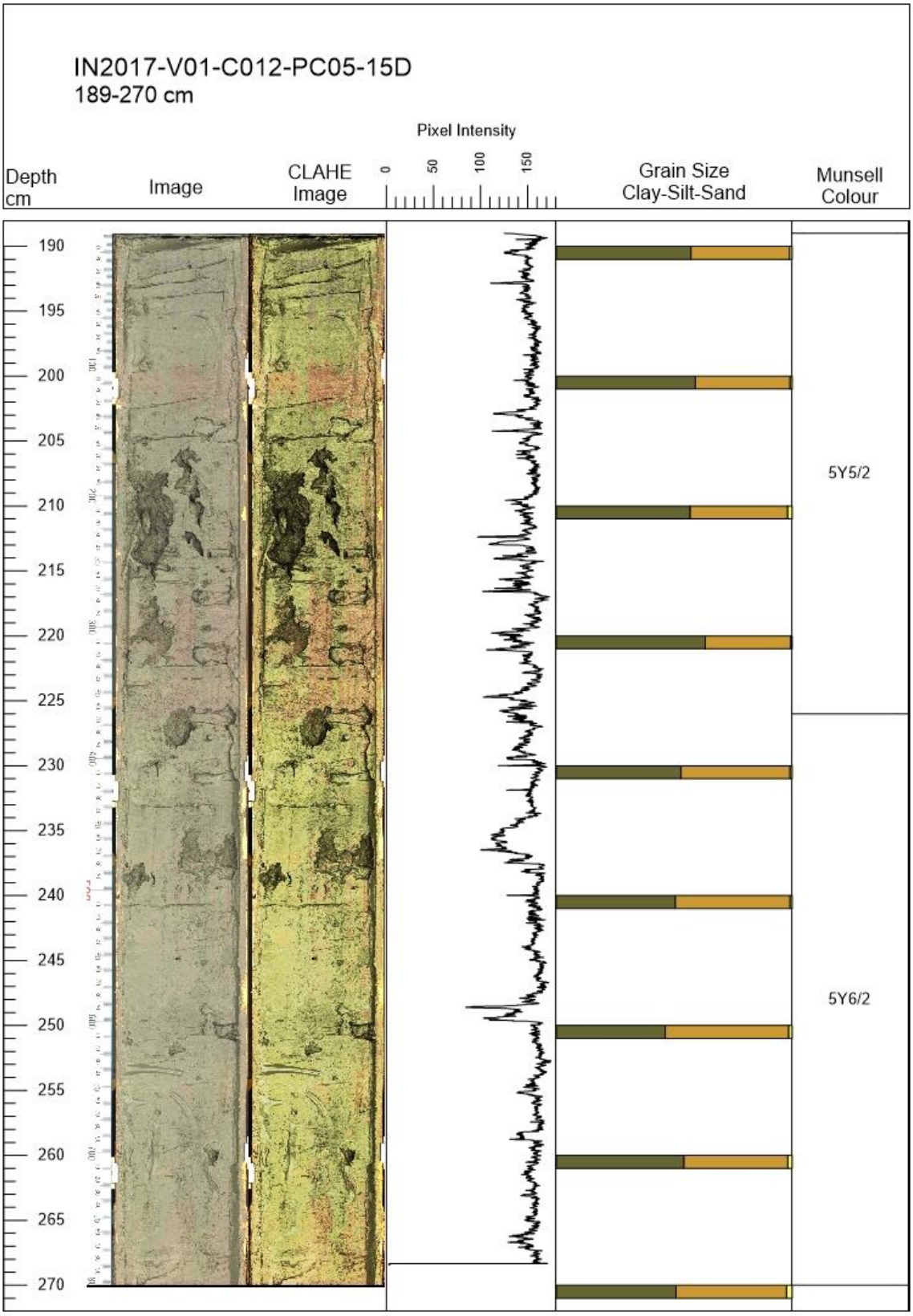
IN2017-V01-C012-PC05-17A
50-122 cm.



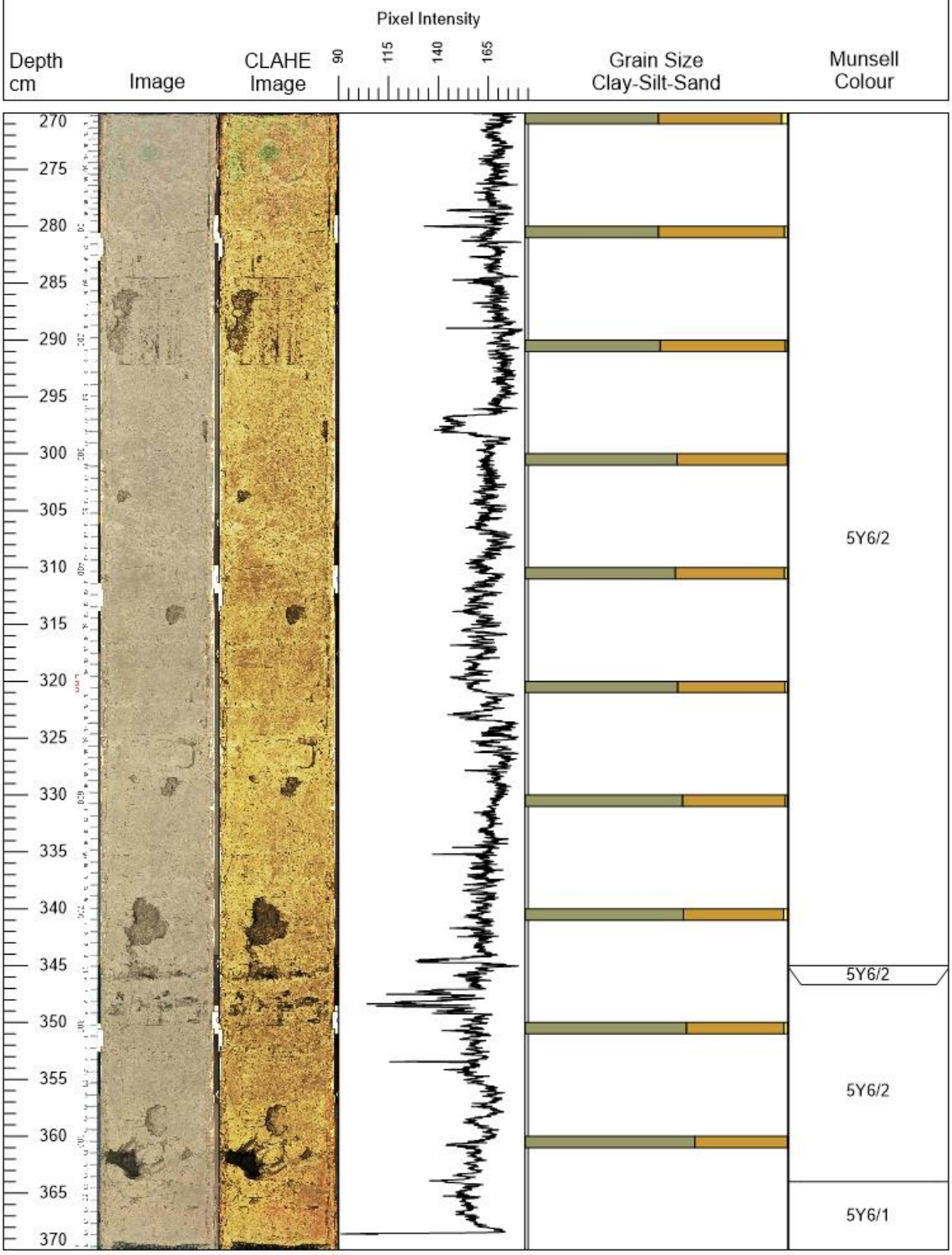
IN2017-V01-C012-PC05-16C
122-189 cm



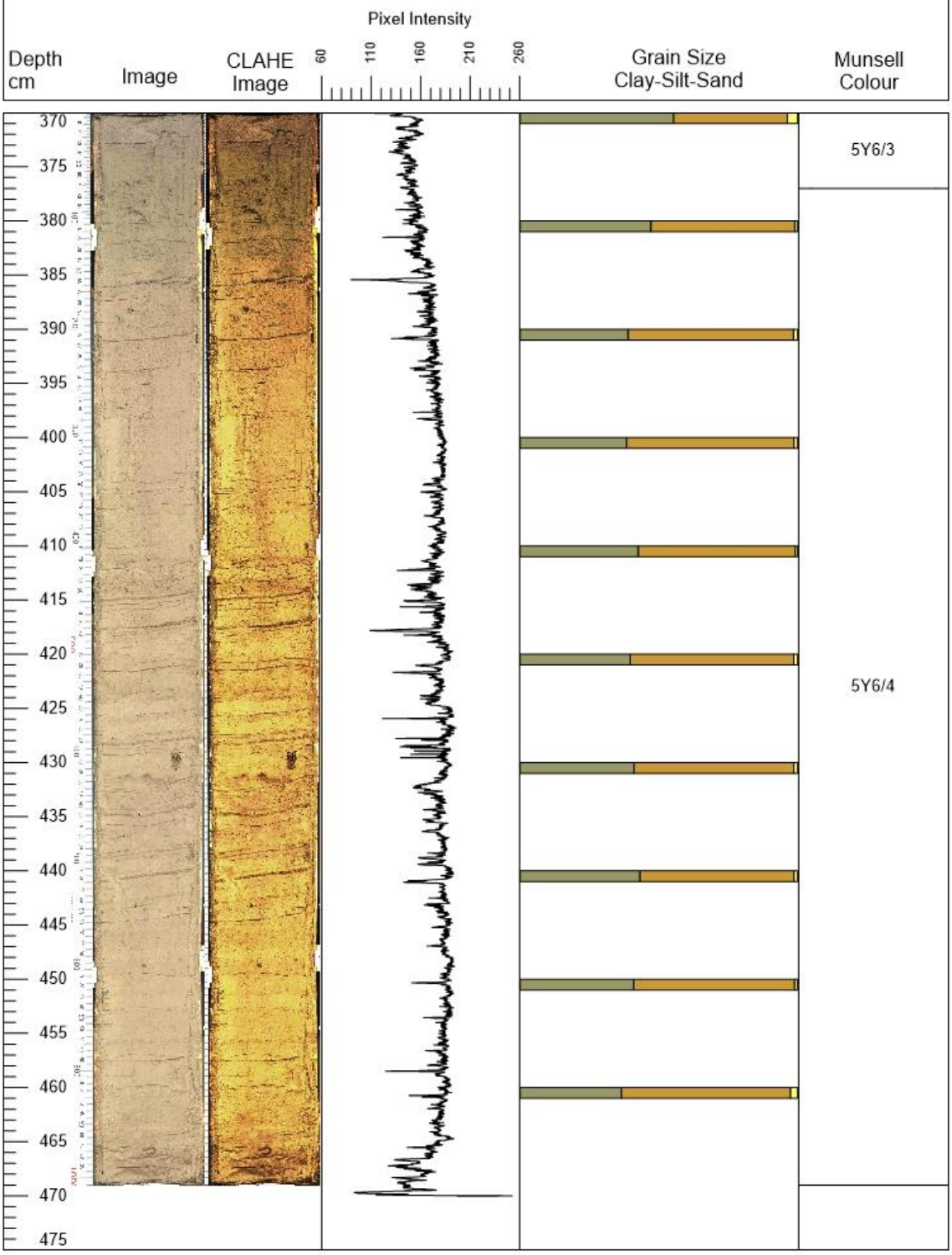
IN2017-V01-C012-PC05-15D
189-270 cm



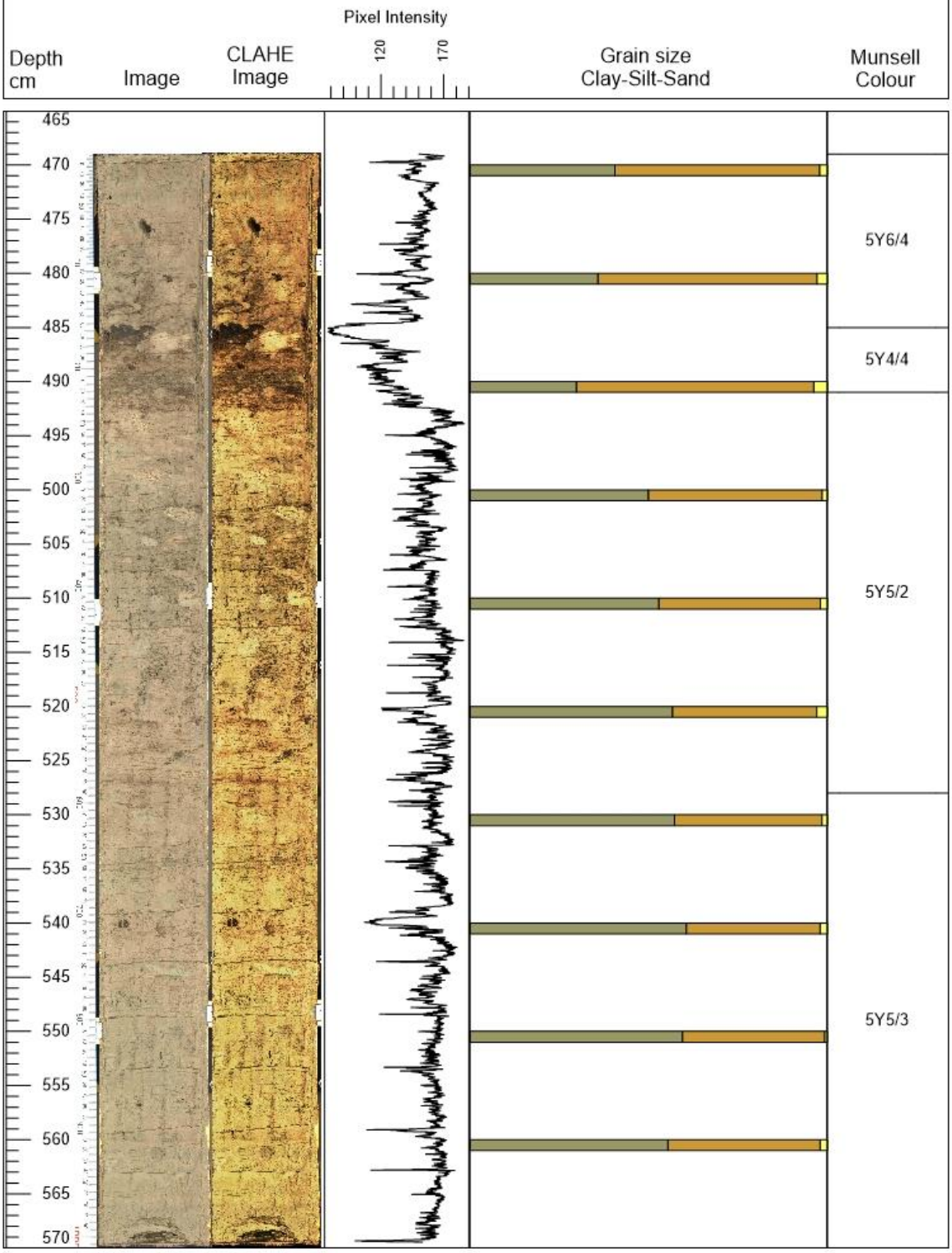
IN2017-V01-C012-PC05-14E
270-370 cm



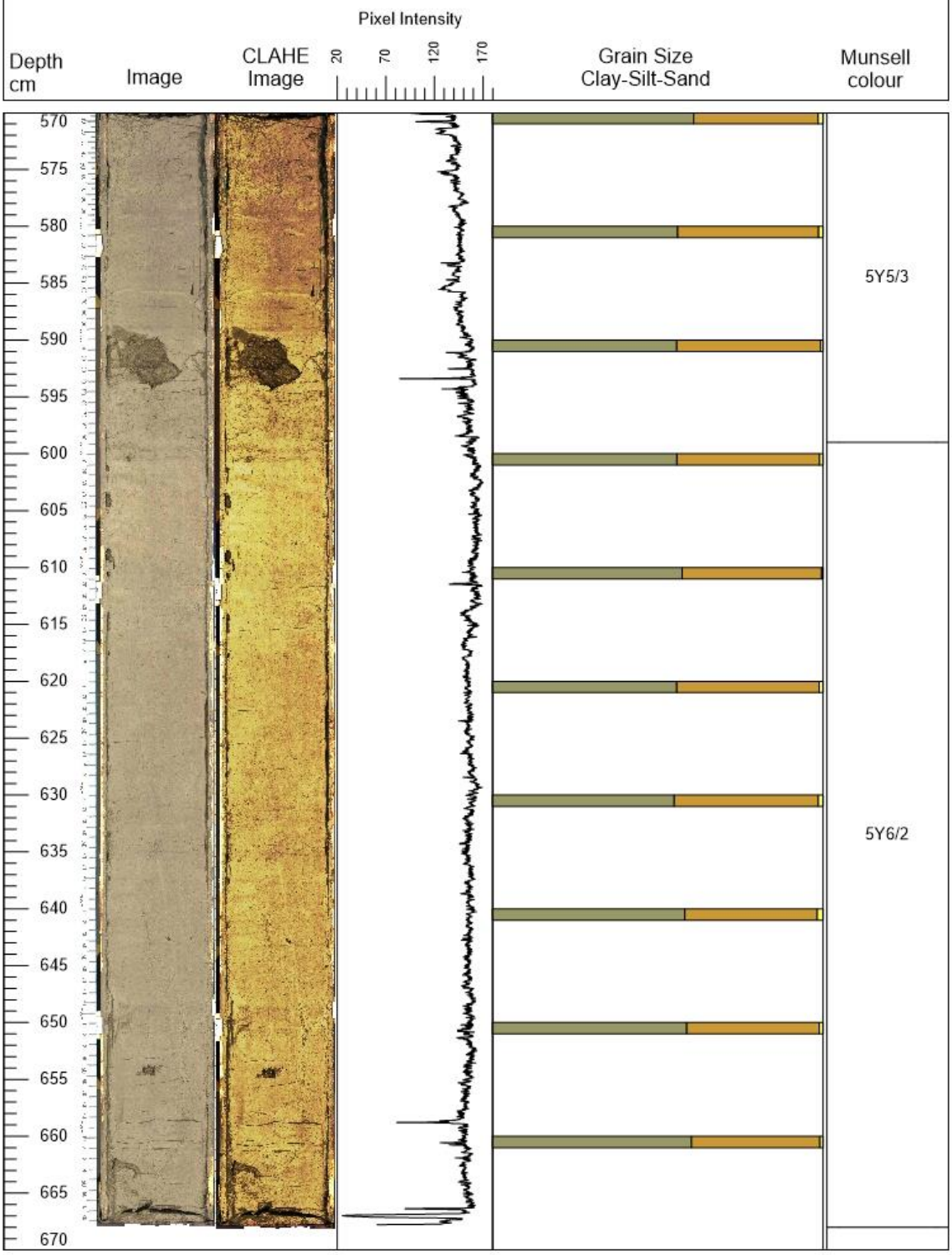
IN2017-V01-C012-PC05-13F
370-469 cm



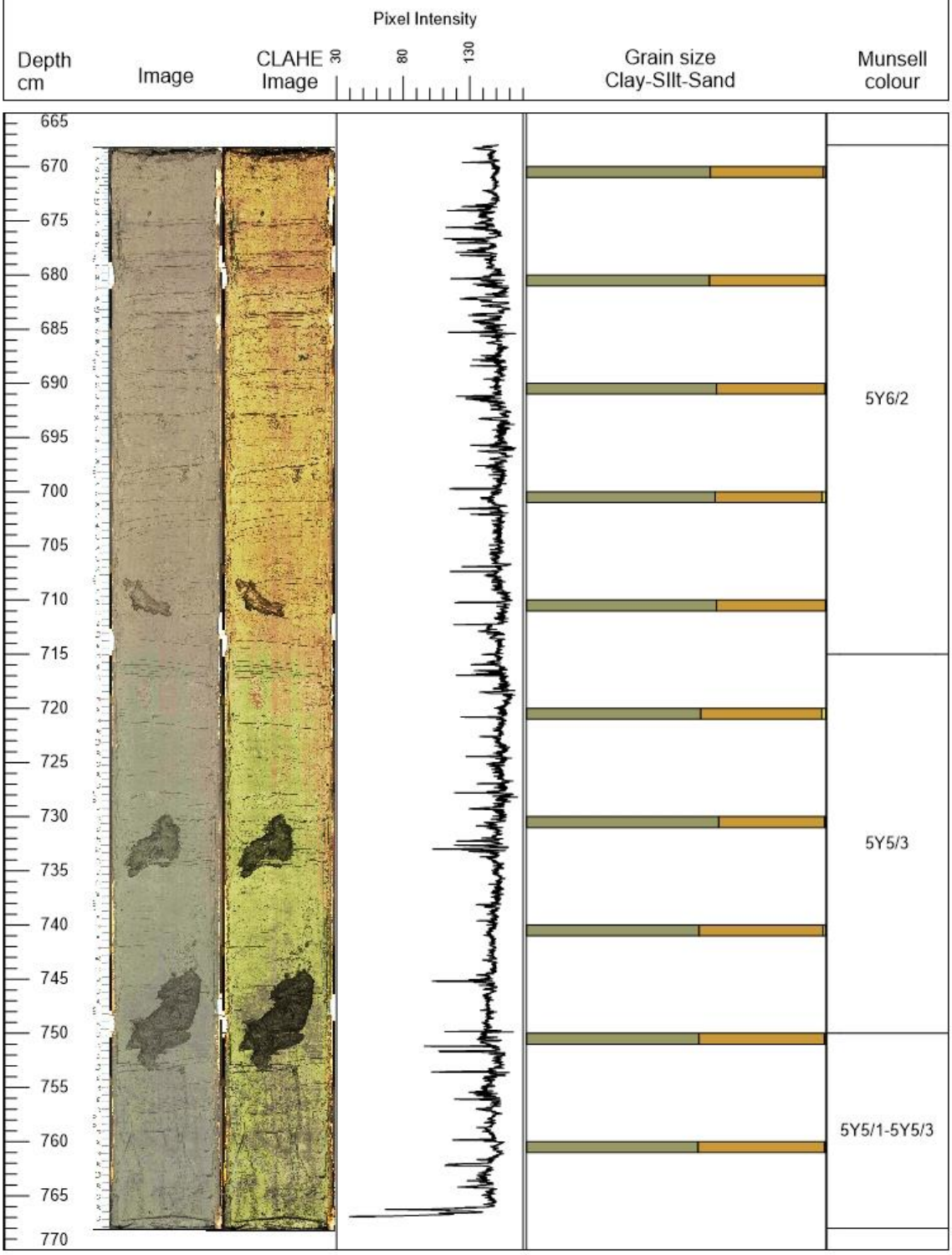
IN2017-V01-C012-PC05-12G
469-570 cm



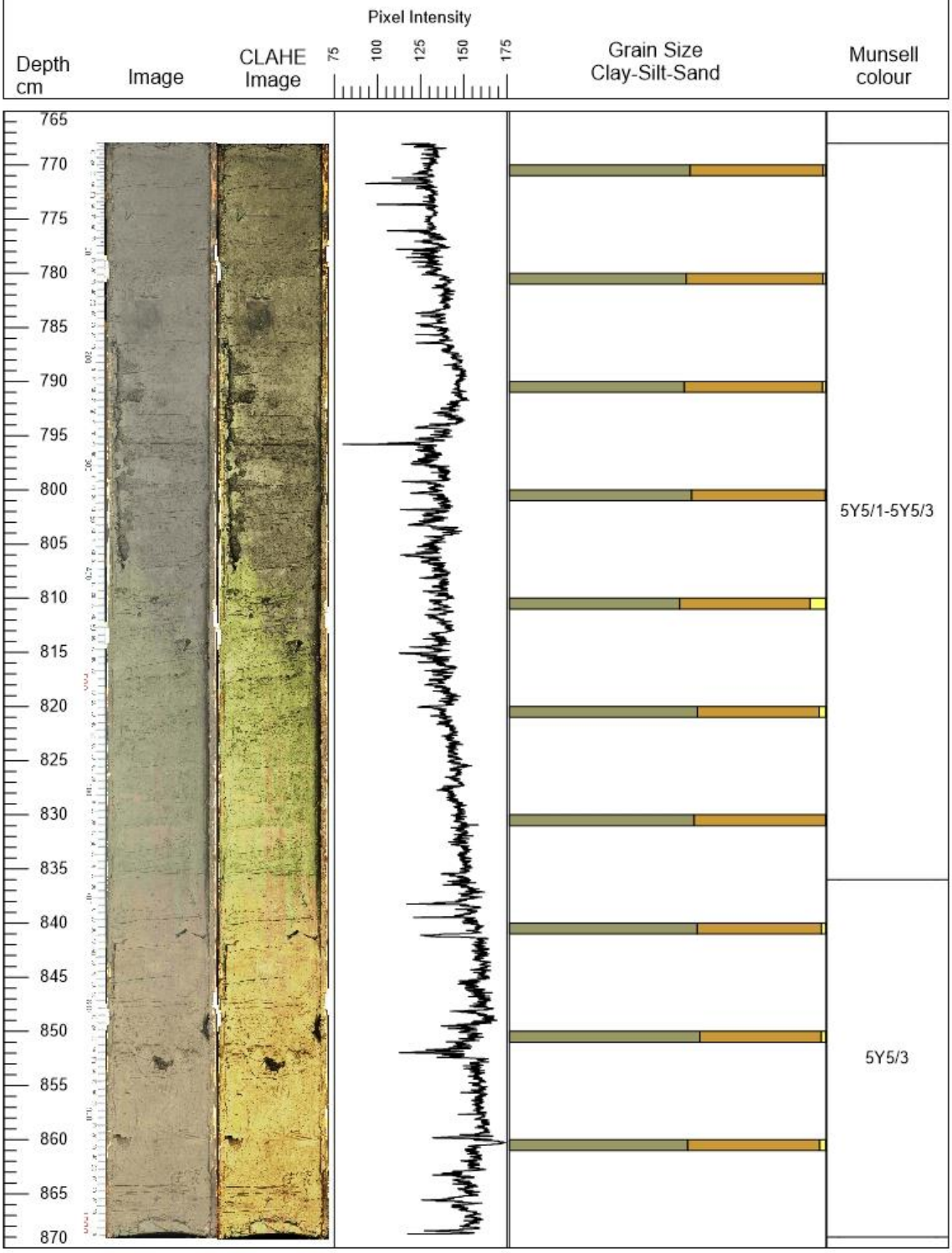
IN2017-V01-C012-PC05-11H
570-668 cm



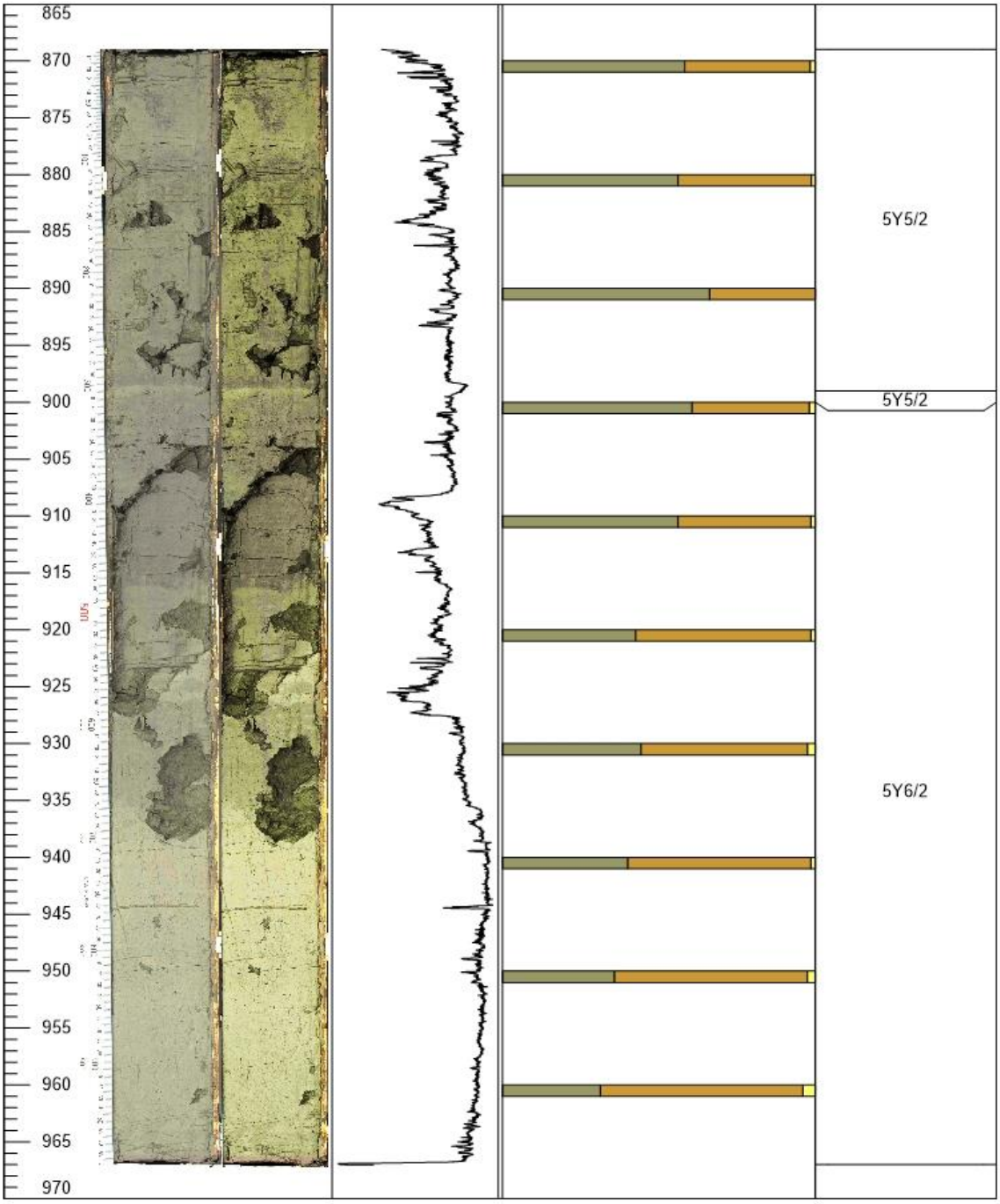
IN2017-V01-C012-PC05-10I
668-768 cm



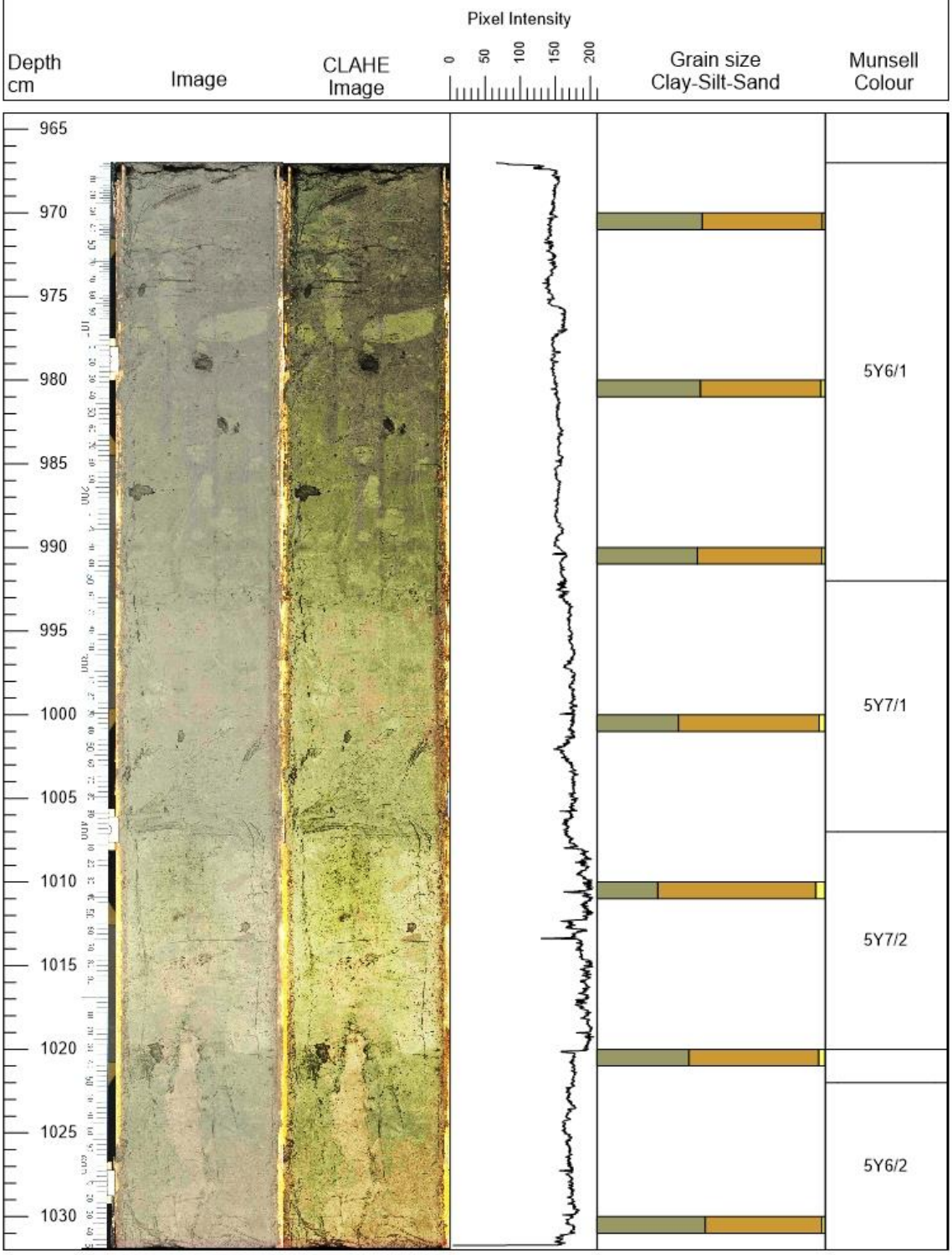
IN2017-V01-C012-PC05-09J
768-869 cm



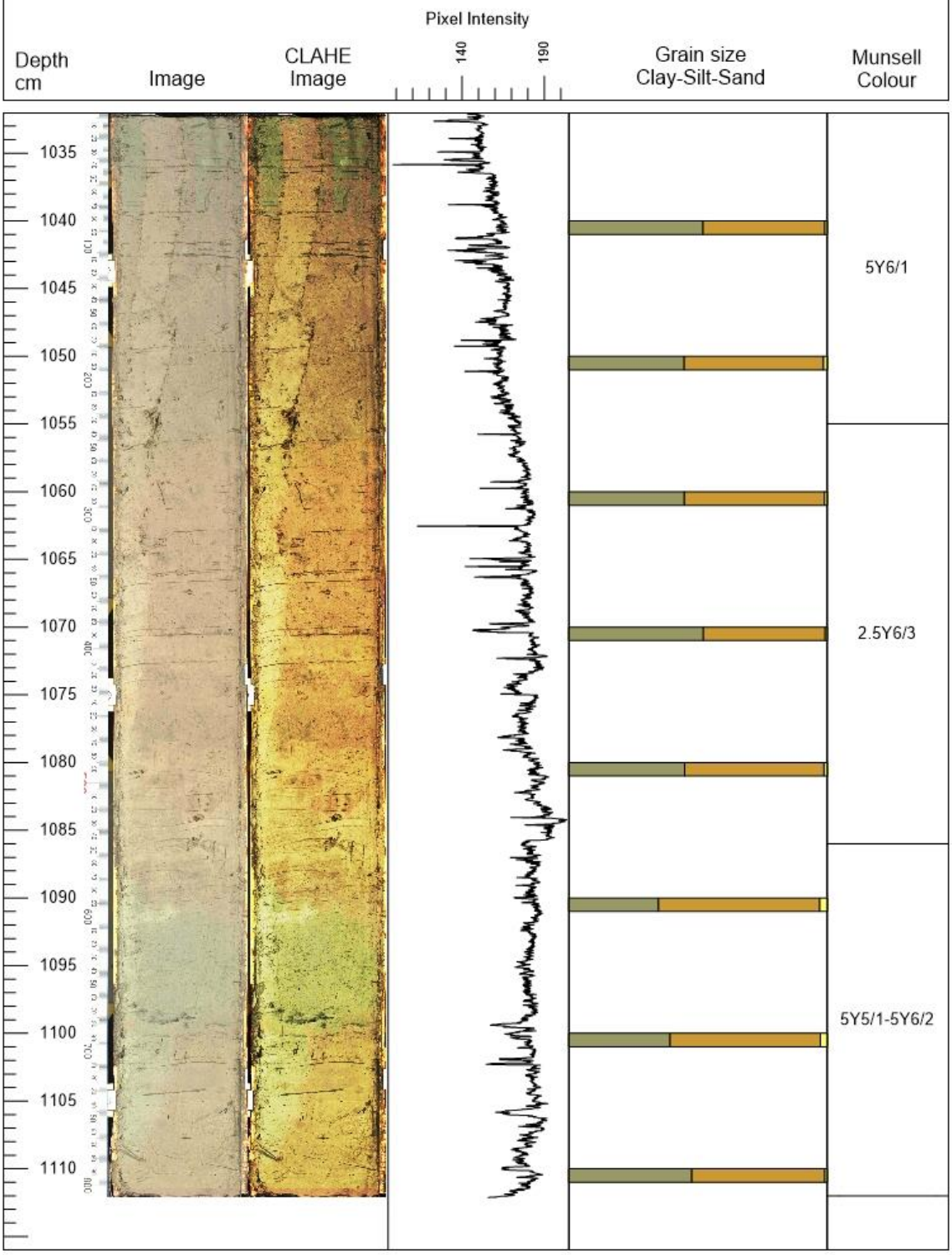
IN2017-V01-C012-PC05-08K
869-967 cm



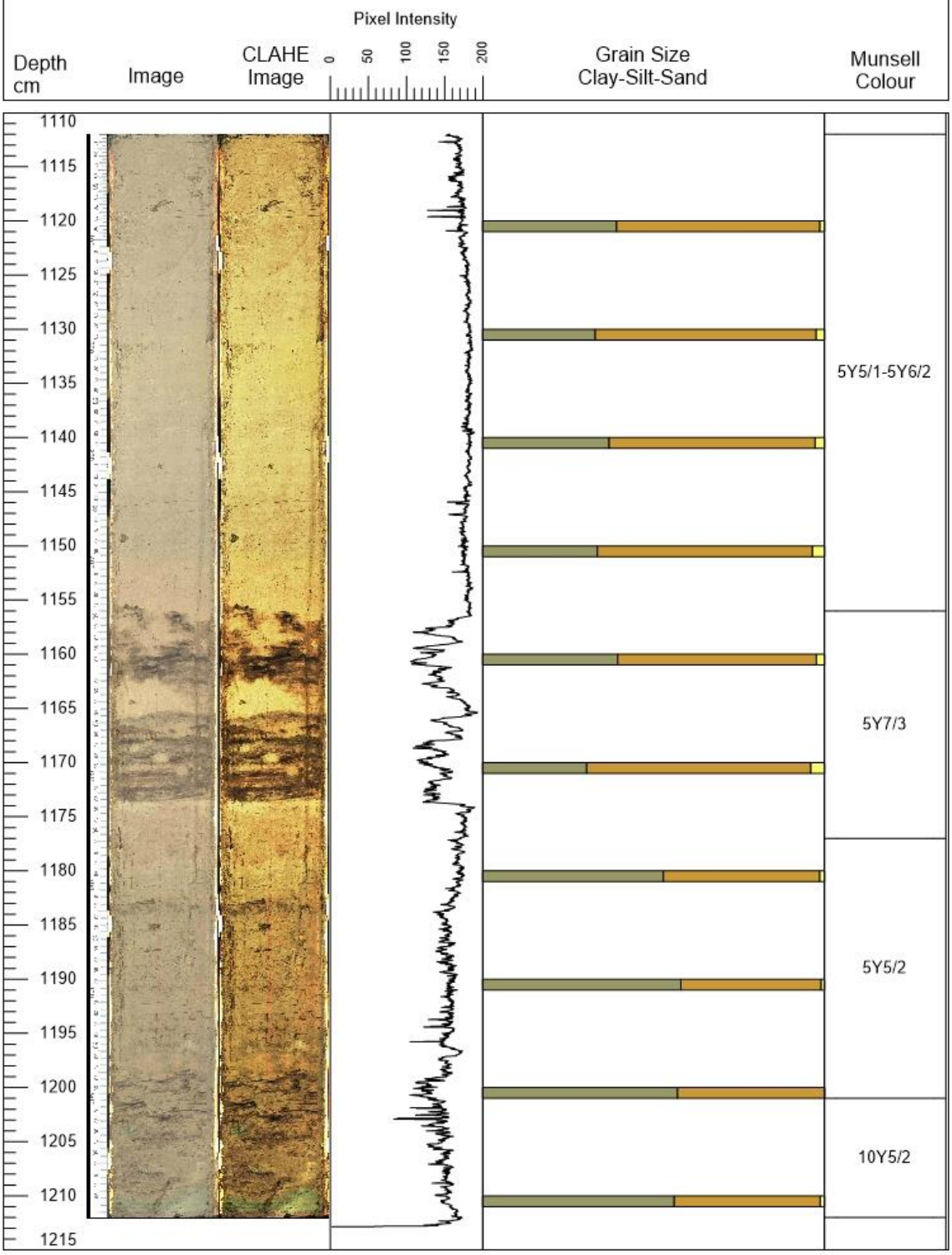
IN2017-V01-C012-PC05-07L
967-1032 cm



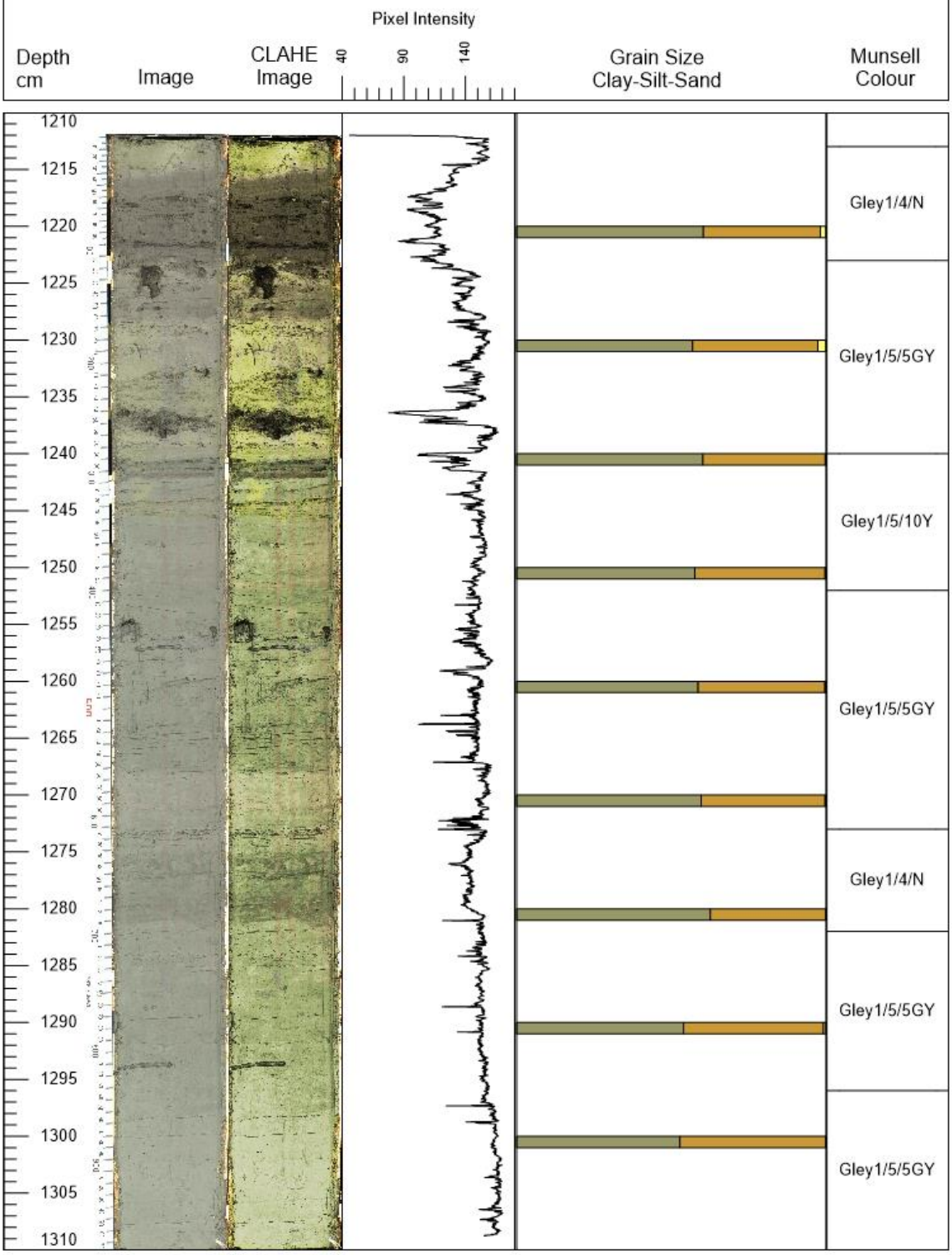
IN2017-V01-C012-PC05-06M
1032-1112 cm



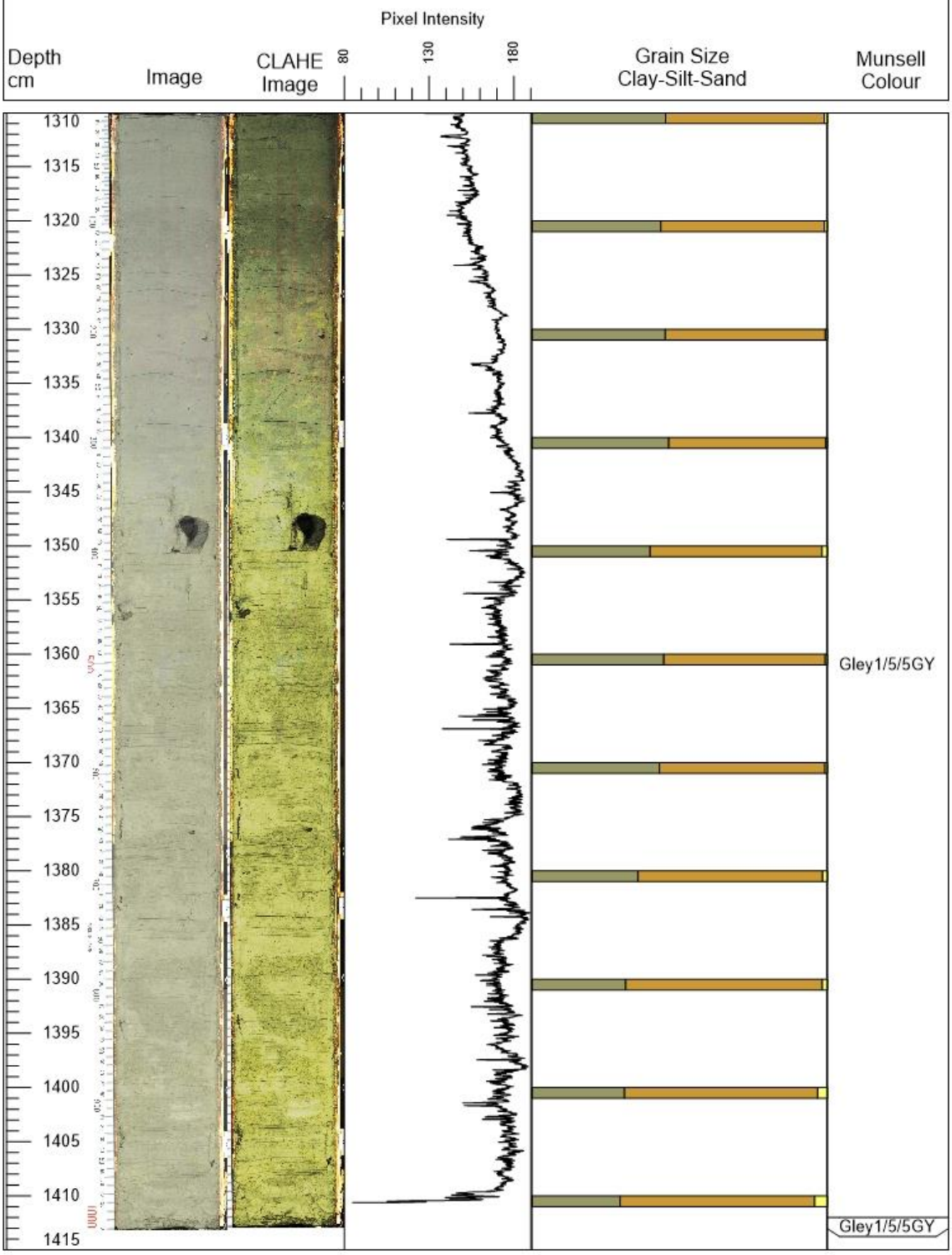
IN2017-V01-C012-PC05-05N
1112-1212 cm



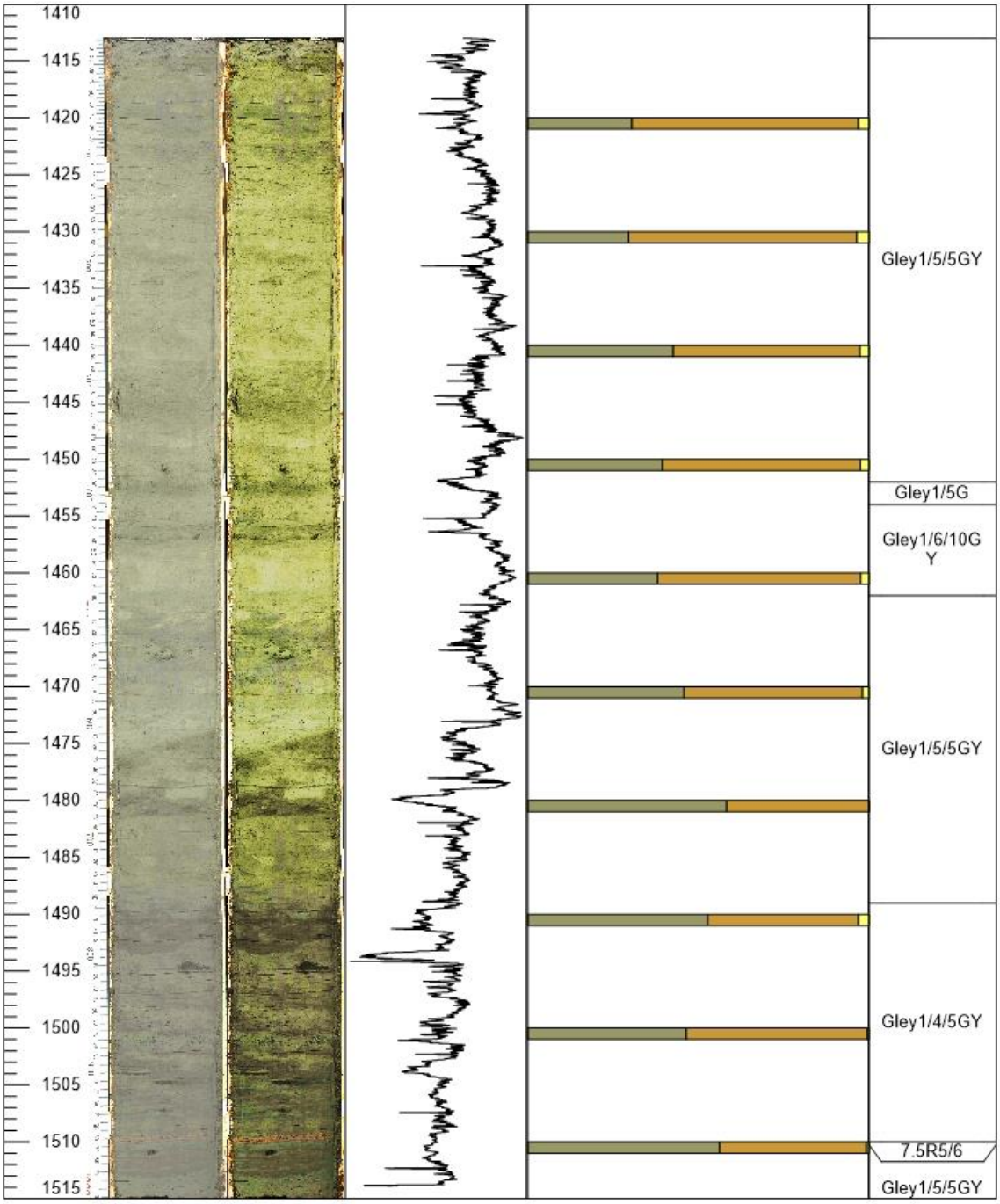
IN2017-V01-C012-PC05-04O
1212-1310 cm



IN2017-V01-C012-PC05-03P
1310-1413 cm



IN2017-V01-C012-PC05-02Q
1413-1515 cm



IN2017-V01-C012-PC05-01R
1515-1609 cm